PO Box 385 Oceanville, NJ 08231-0385 E-Mail ahera@comcast.net

Fax 609.652.1140 Phone 609.652.1833

# INDOOR AIR QUALITY EVALUATION REPORT Annual Assessment

Tuscan Elementary School 25 Harvard Avenue Maplewood, NJ 07040

Prepared for

South Orange/Maplewood School District 525 Academy Street Maplewood, NJ 07040 Attn: Mr. Thomas Giglio

> <u>Survey dates</u>: <u>Inspection performed by:</u>

03/14/2022 Mr. Eric Clarkson Section I Introduction

AHERA Consultants Inc. was retained by the South Orange / Maplewood School District to conduct an annual indoor air quality (IAQ) assessment at the Tuscan Elementary School located in Maplewood, New Jersey. This assessment was performed at the request of Mr. Thomas Giglio, Facilities Director with the South Orange Maplewood School District.

Section II

**Physical Inspection** 

### **Existing Conditions**

On March 14, 2022, I Eric Clarkson of AHERA Consultants, Inc. arrived at the Tuscan Elementary School. The custodial staff provided access to various areas within the building.

Testing and visual inspection of random areas was performed. HVAC systems within this facility consist of boilers, radiators, unit ventilators and window air conditioning units. Periodic maintenance is performed on the system(s).

Based on my observations I determined that ambient air sampling to assess current air quality conditions with respect to temperature, humidity, carbon dioxide CO2, carbon monoxide CO, mold screening and airborne asbestos in random locations inside the building would be appropriate.

#### **Section III**

#### **Sampling Procedures**

- ♦ Indoor air quality measurements for temperature, humidity, CO² and CO were taken utilizing a Model 7545 IAQ-Calc Indoor Air Quality Meter. (See IAQ Investigation Logs provided within this report)
- Asbestos air sampling was conducted utilizing TEM sampling media and a high-volume air sampling pump calibrated to 10 LPM. Testing was conducted in the 1<sup>st</sup> floor hallway.
- Air sampling for airborne fungal bioaerosols was performed utilizing Air-O-Cell Cassettes. 150 liters of air was drawn through each sample. The sampling media was submitted to EMSL Analytical Laboratories in Piscataway, NJ for analysis. Air samples were analyzed within a 72-hour turnaround period.

Section IV Testing Results

**♦ Air-O-Cell Sampling Results** 

March 14, 2022

#### ANALYSIS OF FUNGAL SPORES & PARTICULATES BY OPTICAL MICROSCOPY: AIR-O-CELL Cassette

SAMPLE ID#	SAMPLE LOCATION	PARTICLE ID	COUNT/ m3
		Aspergillus/Penicillium	260
		Basidiospores	200
TEC 04	4d floor boll on	Chaetomium	20
TES-01	1 <sup>st</sup> floor hallway	Cladosporium	20
		Myxomycetes	7
		Total Fungi	507
	Outdoor Control Sample	Alternaria (Ulocladium)	10
		Ascospores	40
TES-02		Aspergillus/Penicillium	200
		Basidiospores	200
		Cladosporium	40
		Total Fungi	490



**Results:** Concentrations of indoor fungal spores were comparable to and considerably lower than the outdoor control sample with respect to the total counts of fungal structures per cubic meter of air (FS/m³). No visible active mold growth was observed at the time of this assessment.

# Asbestos Air Sampling Results Asbestos Fiber Analysis by Transmission Electron Microscopy (TEM) SAMPLE ID # SAMPLE LOCATION Asbestos Type(s) TES-01 1st Floor hallway None Detected <.0044

Results: Sample was "none detected" for asbestos structures.

Section V Interpretation of Resu
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At this time there are no governmental standards regarding Indoor Air Quality. The Occupational Safety and Health Association (OSHA) and the National Institute of Occupational Safety and Health (NIOSH), as well as other occupational health related associations, have not established permissible exposure levels (PELs), recommended exposure limits (RELs), or other limit values for aeroallergens. (See EMSL Expanded Fungal Report) provided herein.

Most of the fungi detected in typical indoor investigations are considered common to both indoor and outdoor environments. These include species that belong to the genera Cladosporium, Aspergillus, Penicillium, Alternaria, Basidiospores and others. False negative and false positive data are possible. However, it is generally accepted in the "indoor air quality" industry that indoor fungal growth is undesirable and may necessitate removal or other appropriate remedial actions.

No remedial project should be based solely on data obtained from culturable fungal bioaerosols to represent a threshold value having a medical or health significance with respect to exposure, nor is it necessarily representative of an unacceptable indoor environment. Rather, it is intended to be a "reactionary threshold" to incite further investigation as to the cause(s) of what is considered to be an above average concentration for culturable indoor bioaerosols.

Under the Public Employees Occupational Safety and Health Program there is currently an indoor air quality standard for the state of New Jersey (NJAC 12:100-13). Additionally, there are recommendations under ASHRAE "The American Society of Heating, Refrigeration, and Air Conditioning Engineers for the Indoor Environment.

Under NJAC 12:100-13 a range of 68 to 79 degrees Fahrenheit is the desired temperature range to maintain with Carbon Dioxide (CO<sup>2</sup>) not exceeding 1000 ppm. If Carbon Dioxide (CO<sup>2</sup>) exceeds 1000 PPM the HVAC system should be evaluated for proper operation.

ASHRAE recommends that a relative humidity between 30% and 60% are acceptable, readings in excess of 70% is considered a friendly environment to microorganisms such as mold.

Carbon Monoxide (CO) levels based on OSHA limits long-term workplace exposure levels to 50 ppm over an 8-hour time weighted average. The Threshold Limit Value or TLV for carbon monoxide is 25 ppm.



#### **Section VI**

#### **Observations/Recommended Response Actions**

#### **Observations:**

Results of the air testing conducted during this assessment did not indicate abnormal or exceptional concentrations of airborne fungal bioaerosols at the time of testing. Relative humidity throughout the building was well below the recommended 30% at the time of testing indicating very dry conditions. The temperature, carbon dioxide and carbon monoxide levels were all within acceptable ranges.

Sampling results for airborne asbestos fibers were none detected.

#### **Recommendations:**

Continue to monitor relative humidity (RH) within the building during different times of the year. RH is typically lower during the winter months due to the heating season. Maintain temperatures between the desired range of 68 and 79 degrees.

To prevent creating environments that would promote mold proliferation all sources of excessive moisture/water infiltration should be identified, controlled and/or eliminated when/if they occur.

Finally, increasing fresh air exchanges within interior spaces should help ameliorate and/or maintain acceptable indoor air quality. Proper cleaning procedures will help eliminate dirt/dust & fungal spore accumulations as well.

Maintain all asbestos containing materials in an intact condition and do not disturb.

#### **ATTACHMENTS:**

IAQ Investigation Logs - (3 Pages)
Asbestos Fiber Analysis Report (1 Page)
EMSL Expanded Fungal Assessment Report - (14 Pages)



#### Tuscan Elementary School 25 Harvard Avenue Maplewood, NJ 07040

IAQ Investigation Log

Tuscan Ele	mentary School
IAQ Calc 7545	
T75451321002	
39	
Test 039	
3/14/2022	
16:32:54	
0:00:01:23	
0:05	
5	
Test 039	
	IAQ Calc 7545 T75451321002 39 Test 039 3/14/2022 16:32:54 0:00:01:23 0:05



Statistics	Channel:	CO2 - Carbon Dioxide	T - Temperature	H - Humidity	CO - Carbon Monoxide
	Units:	ppm	deg F	%rh	ppm
	Average:	469	74.9	17.5	5.6
	Minimum:	459	74.3	16.5	5.4
	Time of Minimum:	16:34:03	16:33:39	16:34:03	16:33:14
	Date of Minimum:	3/14/2022	3/14/2022	3/14/2022	3/14/2022
	Maximum:	494	75.6	19.2	5.9
	Time of Maximum:	16:32:59	16:34:17	16:32:59	16:34:17
	Date of Maximum:	3/14/2022	3/14/2022	3/14/2022	3/14/2022

Calibration	Meter:	6/2/2021			
Calibration	Sensor:	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
-	Cal. Date	6/2/2021	6/2/2021	6/2/2021	6/2/2021

Date	Time	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
MM/DD/YYYY	hh:mm:ss	ppm	deg F	%rh	ppm
3/14/2022	16:32:59	494	74.6	19.2	5.4
3/14/2022	16:33:14	474	75.2	18.7	5.4
3/14/2022	16:33:39	460	74.3	16.6	5.7
3/14/2022	16:34:03	459	75	16.5	5.8
3/14/2022	16:34:17	460	75.6	16.6	5.9

IAQ Investigation Log

Test ID:	Tuscan Elementary School		
Model Number:	IAQ Calc 7545		
Serial Number:	T75451321002		
Test ID:	40		
Test Abbreviation:	Test 040		
Start Date:	3/14/2022		
Start Time:	16:35:21		
Duration (dd:hh:mm:ss):	0:00:01:07		
Log Interval (mm:ss):	0:05		
Number of points:	5		
Notes:	Test 040		



Statistics	Channel:	CO2 - Carbon Dioxide	T - Temperature	H - Humidity	CO - Carbon Monoxide
	Units:	ppm	deg F	%rh	ppm
	Average:	517	79.2	15.9	5.7
	Minimum:	478	78.6	15.4	5.6
	Time of Minimum:	16:36:28	16:35:26	16:36:28	16:35:26
	Date of Minimum:	3/14/2022	3/14/2022	3/14/2022	3/14/2022
	Maximum:	619	79.5	16.6	5.9
	Time of Maximum:	16:35:26	16:36:28	16:35:26	16:36:19
	Date of Maximum:	3/14/2022	3/14/2022	3/14/2022	3/14/2022

Calibration	Meter:	6/2/2021			
Calibration	Sensor:	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
	Cal. Date	6/2/2021	6/2/2021	6/2/2021	6/2/2021

Date	Time	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
MM/DD/YYYY	hh:mm:ss	ppm	deg F	%rh	ppm
3/14/2022	16:35:26	619	78.6	16.6	5.6
3/14/2022	16:35:55	522	79.1	16.1	5.7
3/14/2022	16:36:05	487	79.2	16	5.7
3/14/2022	16:36:19	480	79.4	15.4	5.9
3/14/2022	16:36:28	478	79.5	15.4	5.9

#### Tuscan Elementary School 25 Harvard Avenue Maplewood, NJ 07040

IAQ Investigation Log

Tuscan Ele	mentary School
IAQ Calc 7545	
T75451321002	
41	
Test 041	
3/14/2022	
16:45:04	
0:00:01:32	
0:05	
5	
Test 041	
	IAQ Calc 7545 T75451321002 41 Test 041 3/14/2022 16:45:04 0:00:01:32 0:05 5



Statistics	Channel:	CO2 - Carbon Dioxide	T - Temperature	H - Humidity	CO - Carbon Monoxide
	Units:	ppm	deg F	%rh	ppm
	Average:	443	59	25.4	5.8
	Minimum:	435	57.2	22.6	5.6
	Time of Minimum:	16:45:46	16:46:36	16:45:09	16:45:46
	Date of Minimum:	3/14/2022	3/14/2022	3/14/2022	3/14/2022
	Maximum:	452	60.7	28.8	6.1
	Time of Maximum:	16:46:36	16:45:09	16:46:36	16:45:09
	Date of Maximum:	3/14/2022	3/14/2022	3/14/2022	3/14/2022

Calibration	Meter:	6/2/2021			
Calibration	Sensor:	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
	Cal. Date	6/2/2021	6/2/2021	6/2/2021	6/2/2021

Date	Time	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
MM/DD/YYYY	hh:mm:ss	ppm	deg F	%rh	ppm
3/14/2022	16:45:09	441	60.7	22.6	6.1
3/14/2022	16:45:22	444	60.6	23.3	5.8
3/14/2022	16:45:46	435	58.9	24.3	5.6
3/14/2022	16:46:20	445	57.5	28.3	5.8
3/14/2022	16:46:36	452	57.2	28.8	5.7
		·			



EMSL Order: 052201045 Customer ID: AHER50

Customer PO: Project ID:

Attention: Ahera Consultants, INC
Ahera Consultants, Inc.

Phone: (609) 652-1833
Fax: (609) 652-1140

PO Box 385 Received Date: 03/15/2022 09:00 AM

Project: 22-6032 / Tuscan Elementary School, 25 Harvard Avenue, Maplewood, NJ 07040

# Test Report: Asbestos Fiber Analysis by Transmission Electron Microscopy (TEM) Performed by EPA 40 CFR Part 763 Appendix A to Subpart E

		Volume	Area Analyzed	Non	Asbestos	#Structu	res	Analytical Sensitivity		estos entration
Sample	Location	(Liters)	(mm²)	Asb	Type(s)	≥0.5µ < 5µ	≥5µ	(S/cc)	(S/mm²)	(S/cc)
TES-01	1st Floor Hallway	1350.00	0.0645	0	None Detected	0	0	0.0044	<16.00	<0.0044
052201045-0001										

Analyst(s)

Colin Slattery (1)

Chaiyut Sae Lao, Laboratory Manager or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. Piscataway, NJ NYS ELAP 11423, NVLAP Lab Code 101048-2, NJ NELAC 12037, Philadelphia 289, CT PH-0266





# EXPANDED FUNGAL ASSESSMENT REPORT \*\*

**Prepared Exclusively For** 

AHERA Consultants, Inc.

PO Box 385 Oceanville, NJ 08231-0385 Phone:609-652-1833

Report Date: 3/19/2022

Project: 22-6032 / South Orange / Maplewood School District, Tuscan Elementary School,

25 Harvard Avenue, Maplewood, NJ 07040

EMSL Order: 052201035

AIHA LAP, LLC.

EMLAP #167035



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1056 Stelton Road Piscataway, NJ 08854 Phone: (732) 981-0550 Fax: (732) 981-0551

981-0550 Fax: (732) 981-0551 Web: http://www.EMSL.com Email:piscatawaylab@emsl.com

Attn: AHERA Consultants, INC AHERA Consultants, Inc.

PO Box 385

Oceanville, NJ 08231-0385

EMSL Order: 052201035 Customer ID: AHER50 Collected: 3/14/2022 Received: 3/15/2022 Analyzed: 3/17/2022

Proj: 22-6032 / South Orange / Maplewood School District, Tuscan Elementary School, 25 Harvard Avenue, Maplewood, NJ 07040

#### 1. Description of Analysis

#### **Analytical Laboratory**

EMSL Analytical, Inc. (EMSL) is a nationwide, full service, analytical testing laboratory network providing Asbestos, Mold, Indoor Air Quality, Microbiological, Environmental, Chemical, Forensic, Materials, Industrial Hygiene and Mechanical Testing services since 1981. Ranked as the premier independently owned environmental testing laboratory in the nation, EMSL puts analytical quality as its top priority. This quality is recognized by many well-respected federal, state and private accrediting agencies, and assured by our high-quality personnel, including many Ph.D. microbiologists and mycologists.

EMSL is an independent laboratory that performed the analysis of these samples. EMSL did not conduct the sampling or site investigation for this report. The samples referenced herein were analyzed under strict quality control procedures using state-of-the-art microbiological methods. The analytical methods used and the data presented are scientifically and legally defensible.

The laboratory data is provided in compliance with ISO-IEC 17025 guidelines for the particular test(s) requested, including any associated limitations for the methods employed. These data are intended for use by professionals having knowledge of the testing methods necessary to interpret them accurately.



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Attn: AHERA Consultants, INC AHERA Consultants, Inc.

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Oceanville, NJ 08231-0385

EMSL Order: 052201035 Customer ID: AHER50 Collected: 3/14/2022 Received: 3/15/2022 Analyzed: 3/17/2022

Proj: 22-6032 / South Orange / Maplewood School District, Tuscan Elementary School, 25 Harvard Avenue, Maplewood, NJ 07040

#### Air Samples - Spore traps:

Spore traps are commercially available sampling devices that capture airborne particles on an adhesive slide. Air is pulled through the device using a vacuum pump. Spores, as well as other airborne particles, are impacted on the collection adhesive. Using spore trap collection methods has inherent limitations. These collection methods are biased towards larger spore sizes.

The analysis for total spore counts is a direct microscopic examination and does not include culturing or growing the fungi. Therefore, the results include both viable and non-viable spores. Some fungal groups produce similar spore types that cannot be distinguished by direct microscopic examination alone (i.e., *Aspergillus/Penicillium*, and others). Other spore types may lack distinguishing features that aid in their identification. These types are grouped into larger categories such as Ascospores or Basidiospores.

Fungal spores are identified and grouped by morphological characteristics including color, shape, septation, ornamentation, and fruiting structures (if present) which are compared to published mycological identification keys and texts. EMSL reports provide spore counts per cubic meter of air to three significant figures. Please note that each spore category is reported to three significant figures. Due to rounding and the application of three significant figures the sum of the individual spore numbers may not equal the total spore count on the report. EMSL does not maintain responsibility for final volume concentrations (counts/m3) since this volume is provided by the field collector and cannot be verified by EMSL.

EMSL analyzes spore traps using phase contrast microscopy. There is a wide choice of collection devices (Air-O-Cell, Micro-5, Burkhard, etc.) on the market. Differences in analytical method may exist between spore trap devices.

Spore trap results are reported in spores per cubic meter of air. Due to the other airborne particles collected with the spores, EMSL reports a background particle density. Background density is an indication of overall particulate matter present on the sample (i.e. dust in the air). High background concentrations may obscure spores such as the *Penicillium/Aspergillus* group. The rating system is from 1-5 with 1 = 1 - 25% of the background obscured by material, 2 = 26 - 50%, 3 = 51 - 75%, 4 = 76% - 99%, 5 = 100% or overloaded. A background rating of 4 or higher should be regarded as a minimum count since the actual concentrations may be higher than those reported. EMSL will not be held responsible for overloading of samples. Sample volumes are left to the discretion of the company or persons conducting the fieldwork.

Skin fragment density is the percentage of skin cells making up the total background material, 1 = 1 - 25%, 2 = 26 - 50%, 3 = 51 - 75%, 4 = 76-100%. Skin fragment density is considered an indication of the general cleanliness in the area sampled. It has been estimated that up to 90% of household dust consists of dead skin cells.



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Oceanville, NJ 08231-0385

EMSL Order: 052201035 Customer ID: AHER50 Collected: 3/14/2022 Received: 3/15/2022 Analyzed: 3/17/2022

Proj: 22-6032 / South Orange / Maplewood School District, Tuscan Elementary School, 25 Harvard Avenue, Maplewood, NJ 07040

#### 2. Analytical Results

See attached data reports and charts.



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Oceanville, NJ 08231-0385

EMSL Order: 052201035 Customer ID: AHER50

Collected: 3/14/2022 Received: 3/15/2022

Analyzed: 3/17/2022

Proj: 22-6032 / South Orange / Maplewood School District, Tuscan Elementary School, 25 Harvard Avenue, Maplewood, NJ 07040

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number: Client Sample ID: Volume (L):	0:	52201035-0001 TES-01 150		052201035-0002 TES-02 150					
Sample Location:	1st Floor Hallway			Outdoor Control Sample					
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m <sup>3</sup>	% of Total	-	-	-
Alternaria (Ulocladium)	-	-	-	2*	10*	2			-
Ascospores	-	-	-	2	40	8.2			
Aspergillus/Penicillium	12	260	51.3	8	200	40.8			
Basidiospores	9	200	39.4	7	200	40.8			
Bipolaris++	-	-	-	-	-	-			
Chaetomium++	1	20	3.9	-	-	-			
Cladosporium	1	20	3.9	2	40	8.2			
Curvularia	-	-	-	-	-	-			
Epicoccum	-	-	-	-	-	-			
Fusarium++	-	-	-	-	-	-			
Ganoderma	-	-	-	-	-	-			
Myxomycetes++	1*	7*	1.4	-	-	-			
Pithomyces++	-	-	-	-	-	-			
Rust	-	-	-	-	-	-			
Scopulariopsis/Microascu	-	-	-	-	-	-			
Stachybotrys/Memnoniella	-	-	-	-	-	-			
Unidentifiable Spores	-	-	-	-	-	-			
Zygomycetes	-	-	-	-	-	-			
Total Fungi	24	507	100	21	490	100			
Hyphal Fragment	-	-	-	1	20	-			
Insect Fragment	-	-	-	-	-	-			
Pollen	-	-	-	2	40	-			
Analyt. Sensitivity 600x	-	22	-	-	22	-			
Analyt. Sensitivity 300x	-	7*	-	-	7*	-			
Skin Fragments (1-4)	-	2	-	-	1	-			
Fibrous Particulate (1-4)	-	1	-	-	1	-			
Background (1-5)	-	2	-	-	2	-			

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

No discernable field blank was submitted with this group of samples.

Nicholas Maslowski, Microbiology Lab Manager or Other Approved Signatory

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Initial report from: 03/18/2022 07:26:10

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1056 Stelton Road Piscataway, NJ 08854 Phone: (732) 981-0550 Fax: (732) 981-0551

Attn: AHERA Consultants, INC AHERA Consultants, Inc.

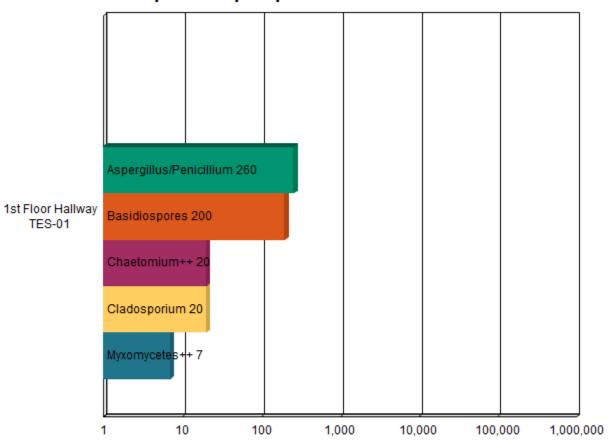
PO Box 385

Oceanville, NJ 08231-0385

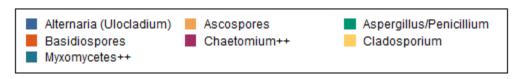
EMSL Order: 052201035 Customer ID: AHER50 Collected: 3/14/2022 Received: 3/15/2022 Analyzed: 3/17/2022

Proj: 22-6032 / South Orange / Maplewood School District, Tuscan Elementary School, 25 Harvard Avenue, Maplewood, NJ 07040

#### Spore Trap Report: Total Counts



Spore Counts per m3



<sup>\*</sup> The chart is displayed using a logarithmic scale. Bar size is not directly proportional to the number of spores.



1056 Stelton Road Piscataway, NJ 08854 Phone: (732) 981-0550 Fax: (732) 981-0551

Attn: AHERA Consultants, INC AHERA Consultants, Inc.

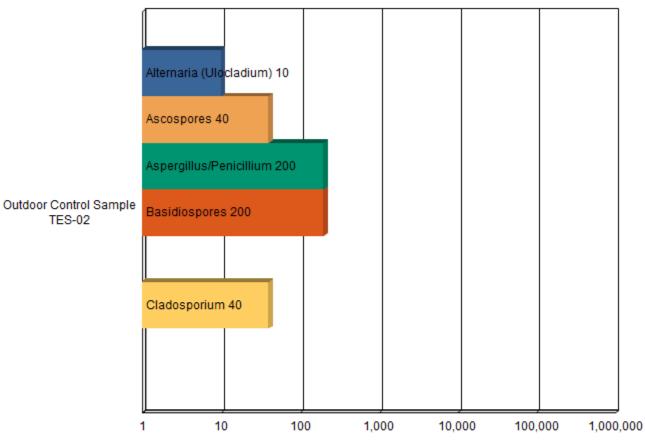
PO Box 385

Oceanville, NJ 08231-0385

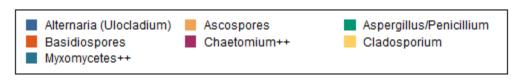
EMSL Order: 052201035 Customer ID: AHER50 Collected: 3/14/2022 Received: 3/15/2022 Analyzed: 3/17/2022

Proj: 22-6032 / South Orange / Maplewood School District, Tuscan Elementary School, 25 Harvard Avenue, Maplewood, NJ 07040

#### Spore Trap Report: Total Counts



Spore Counts per m3



<sup>\*</sup> The chart is displayed using a logarithmic scale. Bar size is not directly proportional to the number of spores.



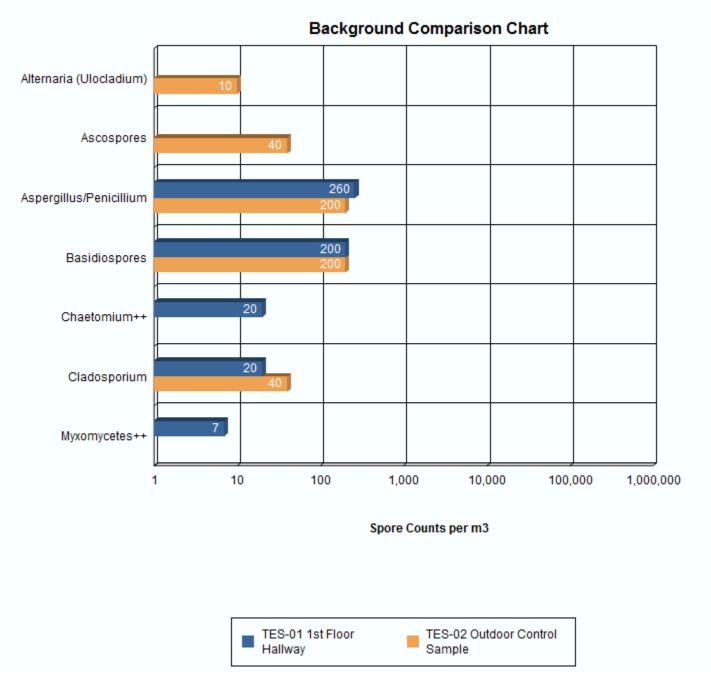
1056 Stelton Road Piscataway, NJ 08854 Phone: (732) 981-0550 Fax: (732) 981-0551

Attn: AHERA Consultants, INC AHERA Consultants, Inc. PO Box 385

Oceanville, NJ 08231-0385

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<sup>\*</sup> The chart is displayed using a logarithmic scale. The bar size is not directly proportional to the number of spores.



1056 Stelton Road Piscataway, NJ 08854 Phone: (732) 981-0550 Fax: (732) 981-0551

0551 Web: http://www.EMSL.com Email:piscatawaylab@emsl.com

Attn: AHERA Consultants, INC AHERA Consultants, Inc.

PO Box 385

Oceanville, NJ 08231-0385

EMSL Order: 052201035 Customer ID: AHER50 Collected: 3/14/2022 Received: 3/15/2022 Analyzed: 3/17/2022

Proj: 22-6032 / South Orange / Maplewood School District, Tuscan Elementary School, 25 Harvard Avenue, Maplewood, NJ 07040

#### 3. Understanding the Results

EMSL Analytical, Inc. is an independent laboratory, providing unbiased and scientifically valid results. These data represent only a portion of an overall IAQ investigation. Visual information and environmental conditions measured during the site assessment (humidity, moisture readings, etc.) are crucial to any final interpretation of the results. Many factors impact the final results; therefore, result interpretation should only be conducted by qualified individuals. The American Conference of Governmental Industrial Hygienists (ACGIH) has published a good reference book covering sampling and data interpretation. It is entitled, <u>Bioaerosols: Assessment and Control</u>, 1999.

Fungal spores are found everywhere. Whether or not symptoms develop in people exposed to fungi depends on the nature of the fungal material (e.g., allergenic, toxic, or infectious), the exposure level, and the susceptibility of exposed persons. Susceptibility varies with the genetic predisposition (e.g., allergic reactions do not always occur in all individuals), age, pre-existing medical conditions (e.g., diabetes, cancer, or chronic lung conditions), use of immunosuppressive drugs, and concurrent exposures. These reasons make it difficult to identify dose/response relationships that are required to establish "safe" or "unsafe" levels (i.e., permissible exposure limits).

It is generally accepted in the industry that indoor fungal growth is undesirable and inappropriate, necessitating removal or other appropriate remedial actions. The New York City guidelines and EPA guidelines for mold remediation in schools and commercial buildings define the conditions warranting mold remediation. Always remember that water is the key. Preventing water damage or water condensation will prevent mold growth.

This report is not intended to provide medical advice or advice concerning the relative safety of an occupied space. Always consult an occupational or environmental health physician who has experience addressing indoor air contaminants if you have any questions.



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#### 4. Glossary of Fungi

ALTERNARIA(ULOC	ALTERNARIA(ULOCLADIUM)					
Natural Habitat	Common saprobe and pathogen of plants. Typically found on plant tissue, decaying wood, and foods. Soil . Air outdoors.					
Suitable Substrates in the Indoor Environment	Indoors near condensation (window frames, showers), House dust (in carpets, and air). Also colonizes building supplies, computer disks, cosmetics, leather, optical instruments, paper, sewage, stone monuments, textiles, wood pulp, and jet fuel					
Water Activity	Aw =0.85-0.88 (water damage indicator)					
Mode of Dissemination	Wind					
Allergic Potential	Type I allergies (hay fever, asthma), Type III (hypersensitivity pneumonitis)					
Potential or Opportunistic Pathogens	Phaeohyphomycosis {causing cystic granulomas in the skin and subcutaneous tissue}. In immunocompetent patients, Alternaria colonizes the paranasal sinuses, leading to chronic hypertrophic sinusitis					
Industrial Uses	Biocontrol of weed plants ·Biocontrol fungal plant pathogens.					
Potential Toxins Produced	Alternariol (AOH) . Alternariol monomethylether (AME). Tenuazonic acid (TeA). Altenuene (ALT). Altertoxins (ATX)					
Other Comments	Many species of Ulocladium have been renamed as Alternaria. Alternaria spores are one of the most common and potent indoor and outdoor airborne allergens. Additionally, Alternaria sensitization has been determined to be one of the most important factors in the onset of childhood asthma. Synergy with Cladosporium or Ulocladium may increase the severity of symptoms					
References	Alternaria redefined. J. Woudenberg et al., Studies in Mycology. Volume 75, June 2013, Pages 171-212					

ASCOSPORES	
Natural Habitat	Everywhere in nature.
Suitable Substrates in the Indoor Environment	Depends on genus and species.
Water Activity	Depends on genus and species.
Mode of Dissemination	Forcible ejection or passive release and dissemination by wind or insects.
Allergic Potential	Depends on genus and species.
Potential or Opportunistic Pathogens	Depends on genus and species.
Industrial Uses	Depends on genus and species.
Potential Toxins Produced	Depends on genus and species.
Other Comments	Ascospores are the result of sexual reproduction and produced in a saclike structure called an ascus. All ascospores belong to members of the Phylum Ascomycota, which encompasses a plethora of genera worldwide.

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ASPERGILLUS/PEN	ASPERGILLUS/PENICILLIUM				
Natural Habitat	Plant debris ·Seed ·Cereal crops				
Suitable Substrates in the Indoor Environment	Grows on a wide range of substrates indoors ·Prevalent in water damaged buildings ·Foods (blue mold on cereals, fruits, vegetables, dried foods) ·House dust ·Fabrics ·Leather ·Wallpaper ·Wallpaper glue				
Water Activity	Aw=0.75-0.94				
Mode of Dissemination	Wind Insects				
Allergic Potential	Type I (hay fever, asthma) ·Type III (hypersensitivity)				
Potential or Opportunistic Pathogens	Possible depending on the species.				
Industrial Uses	Many depending on the species				
Potential Toxins Produced	Possible depending on the species.				
Other Comments	Spores of Aspergillus and Penicillium (including others such as Acremonium, Talaromyces, and Paecilomyces) are small and spherical with few distinguishing characteristics. They cannot be differentiated or speciated by non-viable impaction sampling methods. Some species with very small spores may be undercounted in samples with high background debris.				

BASIDIOSPORES	
Natural Habitat	Forest floors. Lawns .Plants (saprobes or pathogens depending on genus)
Suitable Substrates in the Indoor Environment	Depends on genus. Wood products
Water Activity	Unknown.
Mode of Dissemination	Forcible ejection. Wind currents.
Allergic Potential	Type I allergies (hay fever, asthma) . Type III (hypersensitivity pneumonitis)
Potential or Opportunistic	Depends on genus.
Pathogens	
Industrial Uses	Edible mushrooms are used in the food industry.
Potential Toxins Produced	Amanitins. monomethyl-hydrazine. muscarine. ibotenic acid. psilocybin.
Other Comments	Basidiospores are the result of sexual reproduction and formed on a structure called the basidium. Basidiospores belong to the members of the Phylum Basidiomycota, which includes mushrooms, shelf fungi, rusts, and smuts.

CHAETOMIUM++	
Natural Habitat	Dung. Seeds. Soil. Straw. Genera with like spores include Amesia, Arcopilus, Botryotrichum, Collariella, Dichotomopilus, Ovatospora, Subramaniula and others.
Suitable Substrates in the Indoor Environment	Paper. Sheetrock. Wallpaper.
Water Activity	Aw=0.84-0.89.
Mode of Dissemination	Wind. Insects. Water splash.
Allergic Potential	Type I (asthma and hay fever).
Potential or Opportunistic Pathogens	Onychomycosis. C. perlucidum recognized as a new agent of cerebral phaeohyphomycosis.
Industrial Uses	Cellulase production, Textile testing.
Potential Toxins Produced	Chaetomin. Chaetoglobosins A,B,D and F are produced by Chaetomium globosum.  Sterigmatocystin is produced by rare species

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CLADOSPORIUM	
Natural Habitat	Dead plant matter. Straw. Soil. Woody plants
Suitable Substrates in the Indoor Environment	Fiberglass duct liner. Paint. Textiles. Found in high concentration in water-damaged building materials.
Water Activity	Aw 0.84-0.88
Mode of Dissemination	Air
Allergic Potential	Type I (asthma and hay fever).
Potential or Opportunistic Pathogens	Edema. keratitis. onychomycosis. pulmonary infections. Sinusitis.
Industrial Uses	Produces 10 antigens.
Potential Toxins Produced	Cladosporin and Emodin.

MYXOMYCETES++	
Natural Habitat	Decaying logs, Dead leaves , Dung , Lawns , Mulched flower beds, Lawns
Suitable Substrates in the Indoor Environment	Rotting lumber
Free moisture required for mold growth	Unknown
Mode of Dissemination	Insects, Water, Wind
Allergic Potential	Type I
Potential or Opportunistic Pathogens	Unknown
Industrial Uses	
Other Comments	Includes Myxomycetes, Smut, Rust, and Periconia.



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#### 5. Important Terms, Conditions, and Limitations

Sample Retention

Samples analyzed by EMSL will be retained for 60 days after analysis date Storage beyond this period is available for a fee with written request prior to the initial 30-day period. Samples containing hazardous/toxic substances which require special handling will be returned to the client immediately. EMSL reserves the right to charge a sample disposal fee or return samples to the client.

#### Change Orders and Cancellation

All changes in the scope of work or turnaround time requested by the client after sample acceptance must be made in writing and confirmed in writing by EMSL. If requested changes result in a change in cost the client must accept payment responsibility. In the event work is cancelled by a client, EMSL will complete work in progress and invoice for work completed to the point of cancellation notice. EMSL is not responsible for. holding times that are exceeded due to such changes.

#### Warranty

EMSL warrants to its clients that all services provided hereunder shall be performed in accordance with established and recognized analytical testing procedures and with reasonable care in accordance with applicable federal, state and local laws. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied. EMSL disclaims any other warranties, express or implied, including a warranty of fitness for particular purpose and warranty of merchantability.

#### Limits of Liability

In no event shall EMSL be liable for indirect, special, consequential, or incidental damages, including, but not limited to, damages for loss of profit or goodwill regardless of the negligence (either sole or concurrent) of EMSL and whether EMSL has been informed of the possibility of such damages, arising out of or in connection with EMSL's services thereunder or the delivery, use, reliance upon or interpretation of test results by client or any third party. We accept no legal responsibility for the purposes for which the client uses the test results. EMSL will not be held responsible for the improper selection of sampling devices even if we supply the device to the user. The user of the sampling device has the sole responsibility to select the proper sampler and sampling conditions to ensure that a valid sample is taken for analysis. Any resampling performed will be at the sole discretion of EMSL, the cost of which shall be limited to the reasonable value of the original sample delivery group (SDG) samples. In no event shall EMSL



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be liable to a client or any third party, whether based upon theories of tort, contract or any other legal or equitable theory, in excess of the amount paid to EMSL by client thereunder.

#### Indemnification

Client shall indemnify EMSL and its officers, directors and employees and hold each of them harmless for any liability, expense or cost, including reasonable attorney's fees, incurred by reason of any third-party claim in connection with EMSL services, the test result data or its use by client

# **Chain of Custody**

Client:	AHERA Consultants, Inc.	Project No:	22-	6032				
	PO Box 385	Project Name:	Tuscan Element	ary School				
	Oceanville, NJ 08231-0385		_ 25 Harvard Ave	nue				
Phone:	(609) 652-1833		Maplewood, N.	07040				
		_						
Fax:	(609) 652-1140	Contact:	E. Cla	<u>rkson</u>				
ТҮРЕ:								
AS	BESTOS	<u>LEA</u>	<u>D</u>	OTHER				
AIR BUL WA		AIR BULK WATER	SOIL PAINT OTHER					
ANALYSIS ME	THOD: NJ PROTOCOL							
PCM:	OSHA PLM: POINT OTHER PLM: OTHER	SBESTOS EPA600 COUNTING (gravimetric reduction)	☐ TEM: AHERA ☐ TEM: NIOSH 7 ☐ TEM: EPA LEV ☐ TEM: ASBESTO	EL 11				
	AAS LEAD IN DRINKING WATER AAS LEAD IN PAINT AAS OTHER LEAD AAS OTHER METALS AAS NIOSH 7082 (LEAD IN AIR)	TEM: TEM: TEM: TEM: TEM: TEM: TOTAL D	BULK ANALYSIS MICROVAC DUST EPA NOB (gravimetric red FULL PARTICLE ID UST: EPA/OSHA	uction)				
TURN AROUN	ID TIME:							
☐ 5 DA&	☐ 5 DAX ☐ 72 HOUR ☐ 48 HOUR ☐ 24 HOUR ☐ 6 HOUR ☐ RUSH							
SAMPLE NUM	IBERS:	••	•	_				
CLIENT SAME	PLE NUMBERS: TES-C	<u> 2/</u> то <u>Та</u>	<i>ES-01</i> to	TAL: / EA,				
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	D:			TIME:				
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			receive	D				

MAR: 1 5 2022

BY SP 9:00 am
EMSL PISCATAWAY
Drop Box

OrderID: 052201045

# **GENERAL MONITORING DATA SHEET**

CLIENT:	AHERA CONSULTANTS, INC.	D	ATE:_		03/14/	2022	·		
ADDRES	SS:PO BOX 385								
	OCEANVILLE, NJ 08231-0385	A	NALYS	IS:		TEM			
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SITE AD	DRESS: Tuscan Elementary School	Lo	OT #:_						
25 Harvard Avenue			LDG:_		FL	OOR:			
	Maplewood, NJ 07040						-	<del></del>	
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DATE ANALYZED: DATE TAKEN: 03/14/2022									
<u> </u>	DATE/TIME	n22	R	ECEIV	ED BY		DATE/TIME		
PHONE (	ONSULTANTS, INC. (609)652-1833	PO B	OX 385			OCI	EANVILLE, NJ 08 FAX (609)652-1		

OrderID: 052201035



PO Box 385 Oceanville, NJ 08231-0385 PHONE: 609.652.1833 FAX: 609.652.1140

# **MICROBIOLOGY – CHAIN OF CUSTODY**

Date Collected: 03/14/2022			Date Submitted: 03/14/2022							
Contact: E. Clark	son	Company: AHERA Consultants, Inc.								
Project Location:	Tuscan Elementary School		PO Box 385							
	25 Harvard Avenue	Oceanville, NJ 08231-0385								
	Maplewood, NJ 07040	Phone:	e: (609) 652-1833							
		Fax:	(609) 652-	1140						
Client: South Orai	nge / Maplewood School Dis	trict	E-mail:	info@ah	erainc.com					
Job Number: 22-6032										
	ir Samples	Wipe & Bulk Samples								
	by Air-O-Cell Cassette	Mold & Fungi – Direct Examination								
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· ·	<b>¬</b>			old & Fungi – Direct Examination-						
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Bacterial Coun	<del>                                   </del>			& Gram Stain	.,					
(Three most pr	ominent types)	☐ Bac	cterial Count & Identification							
	<u>ter Samples</u>	ree most prominent types)								
	oliforms, Fecal Coliforms									
(Specify)										
Other (Specify)		l	· · · — · —							
TURN ABOUND TIME:  SAME DAY 1 DAY 2 DAY 3 DAY 14 DAY 5 DAY 6-10 DAY										
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TES-02	BUTDOOR CONTRE	01. SA1	MPLE	1502	7-041					
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Received by:	7-10-10			Potar	Time.					

34 50 9:00 am

MAR: 1 5 2022

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